Equality of MH and HH classes

David Hartman

Computer Science Institute of Charles University, Charles University and
Institute of Computer Science of the Czech Academy of Sciences

(joint work with Andrés Aranda)

Homomorphism-homogeneity of relational structures requires every local homomorphism between finite induced substructures extends to surjective homomorphism on the whole structure [1]. Class of structures possessing this type of homogeneity is denoted as MH. In the same way class MH can be defined via using morphism instead of homomorphism for a local mapping between finite substructures. Since the original paper of Cameron and Nešetřil the question of relationship between these two classes for various types of underlying structures is studied. Rusinov and Schweitzer showed equality of these classes for undirected graphs answering thus open problem of Cameron and Nešetřil. Later, equality these classes was shown for of finite L-colored graphs where L is linear order or an anti-chain with additional minimal and maximal element [3]. These structures are derived from ordinary graphs whose edges are further colored with sets of colors both taken from partially ordered set L and corresponding homomorphisms preserve inclusion of colors. We generalized this structure to allow colors for edges, partial ordered set Q, as well as vertices, partial order set P, showing that for equality of classes for countable P, Q-colored graphs necessary as well as sufficient condition is that Q is a linear order [4].

References

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